

V.3.3-RES-SNGL-SPEC-FILLSPILL SINGLE RESERVOIR REGULATION OPERATION  
SCHEME FILL AND SPILL

Purpose

Scheme FILLSPILL permits the reservoir to pass inflow, meet minimum downstream flow requirements or to fill until a specified pool elevation is reached.

While below the specified pool elevation, inflow is passed as long as minimum downstream requirements can be met or until a limiting discharge [QLIM] is reached. When inflow exceeds the limiting discharge, the pool is allowed to rise until the specified pool elevation is reached. At the specified pool elevation, inflow is passed until the maximum possible discharge pertaining to fully open gates and other facilities of the dam is exceeded and then routing over the spillway is required. Methods of routing are given in the SPILLWAY Scheme.

Input Summary

| <u>Keyword</u>  | <u>Definition and Format</u>  |
|---|---|
| FILLSPILL   | Input opening keyword for scheme  |
| <u>PARMS</u>  | Parameter opening keyword for scheme  |
| [QLIM]  | Limiting discharge before the specified pool elevation is reached - defaults to 0.0   |
| The remaining parameter input for this scheme is identical to the parameter input from TYPE through QSLUICE of the SPILLWAY scheme. |   |
| <u>ENDPARMS</u>   | Parameter ending keyword for this scheme  |
| [TIME-SERIES] <u>1</u> /  | Time series opening keyword for scheme:<br>- Needed only if any time series are entered   |
| [QLIM]  | Proposed limiting discharge time series:<br>S data time interval = Operation data time interval<br>- dimensions = L3<br>- units = CMSD<br>- Missing values are allowed<br>- Missing values default to the value of parameter QLIM |
| [QGEN]  | Generation discharge time series<br>S data time interval = Operation data time interval<br>- dimensions = L3<br>- units = CMSD<br>- Missing values allowed; missing values default to the parameter QGEN                          |

| <u>Keyword</u>   | <u>Definition and Format</u>   |
|------------------|--|
| [QSLUICE]        | Non-generation discharge time series<br>S data time interval = Operation data time interval<br>- dimensions = L3<br>- units = CMSD<br>- Missing values allowed - missing values assigned as constant sluice discharge entered in parameter input |
| [ <u>ENDTS</u> ] | Time series ending keyword for scheme:<br>- needed only if TIME-SERIES was entered   |
| <u>CARRYOVER</u> | Carryover opening keyword for scheme   |
| OLDQ             | Initial non-spillway discharge ( = QGEN + QSLUICE and less than QLIM):<br>- real<br>- positive   |
| <u>ENDCO</u>     | Carryover ending keyword for scheme  |
| ENDFILL          | Input ending keyword for scheme  |

Note:

1/ See 'Time Series Definition' in Section V.3.3-RES-SNGL-SPEC.

### Input Examples

```

FILLSPILL
PARMS
QLIM      500.0
TYPE GATED
CREST      522.00
ELVSQ      522.00      526.00      530.00      534.00      536.00
           540.00
           100.00      24000.00      63000.00      114999.75      144999.69
           211999.62
INTERP LINEAR
PASSEL      524.0
QGEN      100.0
QSLUICE      100.0
ENDP
CARRYOVER
OLDQ      200.00
ENDCO
ENDFILL

```

### Methods

See Section V.3.3-RES-SNGL for detailed information.

1. Pool level below PASSEL for gated spillway or CREST for uncontrolled spillway -- pass inflow if inflow is less than the limiting discharge, QLIM as long as minimum downstream

requirements can be met; pool is allowed to fill if inflow exceeds QLIM.

2. Pool level at PASSEL for gated spillway or CREST for uncontrolled spillway -- inflow is passed if it is less than the maximum possible discharge capacity through fully open gates and other facilities of a dam at the specified pool level; otherwise, routing over spillway is required. Methods of routing are given in SPILLWAY scheme.
3. Pool level above PASSEL for gated spillway or CREST for uncontrolled spillway -- routing over spillway is required. Methods of routing are given in SPILLWAY scheme.

Special cases that exist are as follows:

1. If the FILLSPILL scheme is used with the ADJUST utility and the only observed data specified is pool elevation (OBSH), then for all periods through the last one with observed data, discharges are computed using adjusted pool elevations (equal to observed elevations whenever observed data are available). Spillway routing is not carried out; instead, discharges are interpolated directly from the spillway rating curve. Continuity is not preserved. After the last observed pool elevation, both pool elevations and discharges are simulated by the routing methods given in the SPILLWAY Scheme, again using the last observed pool elevation and adjusted discharge as a starting point for the new simulation process. This special case should be used whenever observed pool elevations are dependable. This option can be activated by specifying Time Series Keywords OBSH, ADJH, and ADJQO and/or ADJQOM in the ADJUST utility simultaneously.

### User Guidelines

In general, the limiting discharge would be the maximum generation discharge for a power dam. For a non-power dam, however, the limiting discharge would be the minimum reservoir release requirement or the maximum sluice discharge depending on the reservoir function. If a reservoir is used solely for flood control, the rule of operation is to vacate the reservoir as fast as possible during each flood to preserve the flood control capacity for next flood. In this case, the limiting discharge would be the maximum sluice discharge. If a reservoir is intended for recreation or navigation, the rule of operation would be to conserve as much water as possible. If there is a minimum downstream flow requirement, the minimum reservoir release to meet this requirement would become the limiting discharge.

The pass inflow elevation [PASSEL] would generally be about 0.5 feet below the top of a closed gate. As soon as this elevation is reached, gates and other facilities are assumed to be able to open to close as required to pass inflow. Inflow will be passed at the pass inflow elevation until the maximum discharge capacity through fully open gates and other facilities is reached. Routing over the spillway would be required if inflow exceeds the maximum possible

discharge.